

# LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

## Volume 5 | Technical Appendices

CFA20 | Curdworth to Middleton

**Data appendix (AQ-001-020)**

Air quality

November 2013

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Department  
for Transport

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# Appendix AQ-001-020

|                       |                        |     |
|-----------------------|------------------------|-----|
| Environmental topic:  | Air quality            | AQ  |
| Appendix name:        | Data appendix          | 001 |
| Community forum area: | Curdworth to Middleton | 020 |

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# 1 Air quality

## 1.1 Introduction

1.1.1 The air quality appendices for Curdworth to Middleton community forum area (CFA20) comprise:

- discussion of the policy framework (Section 2);
- baseline air quality data (Section 3);
- dust impact evaluation and risk rating (Section 4); and
- air quality assessment – road traffic (Section 5).

1.1.2 Maps referred to throughout the air quality appendix are contained in the Volume 5 air quality map book.

## 2 Policy framework

- 2.1.1 Warwickshire County Council (WCC) works with the five district and borough councils (North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Rugby Borough Council, Stratford-on-Avon District Council and Warwick District Council) within Warwickshire to address transport related air quality issues.
- 2.1.2 The WCC Local Transport Plan<sup>1</sup>, covering the period 2011-2026, includes an air quality strategy, which outlines a number of policies aimed at improving air quality across the county. The major themes of the air quality strategy are:
- to improve areas with poor air quality and maintain those areas that currently experience good air quality;
  - to encourage sustainable forms of transport, which reduce reliance on private vehicle use and minimises emissions to air; and
  - to promote awareness of alternative travel choices.
- 2.1.3 Policy AQA2 of the local transport plan air quality strategy, Improving Poor Air Quality through Partnership Working, is concerned with the preparation of air quality action plans (AQAP) and the implementation of traffic management improvements within air quality management areas (AQMA) and wider initiatives to change travel behaviour to encourage walking, cycling and the greater use of public transport.
- 2.1.4 Policy AQA3 of the local transport plan air quality strategy, Maintaining Areas of Good Air Quality, indicates that the lorry route map for Warwickshire will be reviewed every two to three years. This is potentially relevant to heavy duty vehicle (HDV) movements associated with the construction phase of the Proposed Scheme.
- 2.1.5 Policy AQ5 of the local transport plan air quality strategy, Integration of Air Quality and Transport Planning, states that WCC will provide input to the preparation of district and borough council local development frameworks and to individual planning applications to negotiate appropriate air quality and transport improvements.
- 2.1.6 The local planning authority for the Curdworth to Middleton area is North Warwickshire Borough Council (NWBC) and the relevant adopted local plan for the Curdworth to Middleton area is the North Warwickshire Local Plan 2007<sup>2</sup>.
- 2.1.7 The saved policies of the NWBC local plan form the adopted policy for the purposes of development management in North Warwickshire. These policies will eventually be superseded by the emerging core strategy; however, until then, they remain a material consideration.
- 2.1.8 Policy ENV9: Air Quality is the most directly relevant policy. The policy is committed to safeguarding and enhancing air quality in the borough. The policy includes reference to: not permitting polluting forms of development within or adjacent to AQMAs.

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<sup>1</sup> Warwickshire County Council (2010/2011), *Warwickshire Local Transport Plan, 2011-2026*.

<sup>2</sup> North Warwickshire Borough Council (2006), *North Warwickshire Local Plan*; adopted 2006.

- 2.1.9 Policy ENV11: Neighbour Amenities is a key consideration though not limited to air quality. The policy advises that development will not be permitted where it entails significant loss of amenity for nearby occupiers, including overlooking, loss of privacy, or disturbance due to traffic, offensive smells, noise, light, dust or fumes.
- 2.1.10 Emerging planning policy is provided by NWBC Local Plan Core Strategy –Submission Version, February 2013<sup>3</sup>. The Core Strategy forms part of NWBC emerging local plan and when adopted will replace, in part, the NWBC local plan 2006.
- 2.1.11 The core strategy does not refer directly to air quality. Policy NW19: Infrastructure states that a key priority for the implementation of the strategy's policies and proposals is the protection and enhancement of the environment and mitigation of the environmental impact of development, past and proposed.

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<sup>3</sup> North Warwickshire Borough Council (2013), *North Warwickshire Core Strategy – Submission Version*, February 2013.

## 3 Baseline air quality data

### 3.1 Existing air quality

#### Local authority review and assessment information

- 3.1.1 Under Part IV of the Environment Act 1995, all local authorities are responsible for local air quality management (LAQM). Under the LAQM regime, a local authority is required to undertake regular review and assessment of local air quality, the findings of which are reviewed by Defra prior to publication.
- 3.1.2 If an area is identified as being unlikely to achieve an air quality standard and there are sensitive receptors to be exposed over the relevant exposure period, then the local authority is required to designate an AQMA and develop an AQAP to improve local air quality.
- 3.1.3 There are no AQMAs within the NWBC administrative area and therefore no AQMAs within the Curdworth to Middleton area.

#### Local air quality monitoring data

- 3.1.4 Monitoring sites within the study area that are considered relevant for this assessment are shown in Volume 5: Map AQ-01-020. The following sections provide a summary of the recorded pollutant concentrations at these sites.
- 3.1.5 The pollutant concentrations can be compared to the air quality standards:
- $40\mu\text{g}/\text{m}^3$  as an annual mean for  $\text{NO}_2$  and  $\text{PM}_{10}$ ;
  - $200\mu\text{g}/\text{m}^3$  one-hour mean for  $\text{NO}_2$  not to be exceeded more than 18 times a year (equivalent to the 99.8<sup>th</sup> percentile of the one-hour mean);
  - $50\mu\text{g}/\text{m}^3$  24-hour mean for  $\text{PM}_{10}$  not to be exceeded more than 35 times a year (equivalent to the 90.4<sup>th</sup> percentile of the 24-hour mean); and
  - $25\mu\text{g}/\text{m}^3$  as an annual mean for  $\text{PM}_{2.5}$ .

#### Continuous monitoring

- 3.1.6 There are no continuous air quality monitoring stations within the Curdworth to Middleton area.

#### Diffusion tubes

- 3.1.7 This section summarises the results from the diffusion tube sites that are considered relevant for the assessment of air quality in the Curdworth to Middleton area.
- 3.1.8 NWBC also measures annual mean  $\text{NO}_2$  concentrations using passive diffusion tubes located across its administrative area. In 2011 there were 17 diffusion tube sites, three of which are located within the Curdworth to Middleton area: two are roadside sites located on the edge of Curdworth, 800m and 900m west of the centre line of the Proposed Scheme; and one is a roadside site on Bodymoor Heath Lane adjacent to the Kingsbury Water Park rural area, approximately 1.3km east of the centre line of the Proposed Scheme. Annual mean  $\text{NO}_2$  concentrations for these sites for the period 2008 to 2012 inclusive are presented in Table 1.

Table 1: Annual mean NO<sub>2</sub> concentrations recorded at diffusion tube monitoring sites<sup>5</sup>

| Site                      | Coordinates    | Annual mean NO <sub>2</sub> concentrations (µg/m <sup>3</sup> ) |      |      |      |      |
|---------------------------|----------------|---|------|------|------|------|
|                           |                | 2008  | 2009 | 2010 | 2011 | 2012 |
| Coleshill Road, Curdworth | 418278, 292300 | 26  | 23   | 28   | 20   | 24   |
| Farthing Lane, Curdworth  | 418186, 292959 | 27  | 22   | 29   | 22   | 25   |
| Kingsbury                 | 420380, 295902 | 27  | 23   | 25   | 21   | 26   |

- 3.1.9 The concentrations recorded by the diffusion tubes are below the relevant annual mean air quality standard, indicating that baseline air quality conditions in the Curdworth to Middleton area are below the NO<sub>2</sub> annual mean air quality standard.

### Background pollutant concentrations

- 3.1.10 Estimates of background air quality have been obtained from the Department for Environment, Food and Rural Affairs (Defra) for 2012 and future years (2017 and 2026)<sup>4</sup>. These data are estimated for 1km grid squares for nitrogen oxides (NO<sub>x</sub>), NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. NO<sub>2</sub> annual mean concentrations ranged from 16µg/m<sup>3</sup> to 26µg/m<sup>3</sup> in 2012, PM<sub>10</sub> annual mean concentrations ranged from 15µg/m<sup>3</sup> to 19µg/m<sup>3</sup> in 2012 and PM<sub>2.5</sub> concentrations ranged from 10µg/m<sup>3</sup> to 13µg/m<sup>3</sup> in 2012. All average pollutant concentrations are below the relevant air quality standards.
- 3.1.11 The diffusion tube monitoring data are considered to be sufficient to indicate the baseline air quality of the predominantly rural area and show good agreement with the background air quality maps produced by Defra. Data from these two sources are considered to be appropriate to characterise baseline air quality conditions along the Proposed Scheme in the Curdworth to Middleton area.

### Local emission sources

- 3.1.12 The main source of emissions of NO<sub>x</sub> and PM<sub>10</sub> in the Curdworth to Middleton area is road traffic from the M<sub>42</sub> and M<sub>6</sub> Toll which run through the Curdworth to Middleton area<sup>5</sup>. There are a number of permitted part A industrial processes<sup>6</sup>. These are a sludge disposal works adjacent to Lichfield Road, Water Orton, part of which is within the land required for the Proposed Scheme; and a landfill operation near Dunton Hall, approximately 100m west of the centre line of the Proposed Scheme. Due to the nature of the emissions from these Part A processes, it is unlikely that these will have an effect on local air quality within the Curdworth to Middleton area. Contributions to local pollutant concentrations made by these industrial installations are included within background concentrations used in the assessment.

<sup>4</sup> Department for Environment, Food and Rural Affairs; Background Maps; <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>; accessed: July 2013.

<sup>5</sup> North Warwickshire Borough Council (2013), *2013 Air Quality Progress Report for North Warwickshire Borough Council*.

<sup>6</sup> Identified from Environment Agency; What's in your backyard website; <http://www.environment-agency.gov.uk/default.aspx>; accessed July 2013. A Part A process is an industrial operation requiring a permit to operate from the Environment Agency under the Environmental Permitting regime, and as such is considered a significant source of pollution.

## 3.2 Receptors

### Human

- 3.2.1 Human receptors which are considered to be susceptible to changes in air quality due to construction or operation of the Proposed Scheme have been identified.

#### *Construction phase*

- 3.2.2 Human receptors that could potentially be affected by the construction phase of the Proposed Scheme are shown in Volume 5: Map AQ-02-020-01, Map AQ-02-020-02 and Map AQ-02-020-03, for receptors relevant to the construction dust assessment and Volume 5: Map AQ-01-020 for receptors relevant to the construction traffic emissions assessment. These include:

- properties around Newlands Farm, Faraday Avenue, Curdworth;
- Dunton Hall and Elford on A4097 Kingsbury Road, Curdworth;
- properties around Marston Lane, Curdworth;
- property along Cuttle Mill Lane, Wishaw;
- property at Middleton Farm, off A4091 Tamworth Road, Middleton;
- Primrose Cottage, Bodymoor Heath Lane, Middleton;
- Pool House Farm, Brick Kiln Lane, off A4091 Tamworth Road, Middleton;
- properties along Church Lane, Middleton; and
- Parkgate Farm, A4091 Tamworth Road, Middleton.

#### *Operational phase*

- 3.2.3 Human receptors that could potentially be affected by the operation of the Proposed Scheme:

- properties on A4097 Kingsbury Road, Curdworth;
- Primrose Cottage, Bodymoor Heath Lane, Middleton;
- Pool House Farm on Brick Kiln Lane, off the A4091 Tamworth Road, Middleton; and
- properties along Church Lane, Middleton.

### Ecological

#### *Construction phase*

- 3.2.4 One statutory designated ecological receptor has been identified within the Curdworth to Middleton area. This is Middleton Pool Site of Special Scientific Interest (SSSI), which is located to the east of the A4091 Tamworth Road. There are two local wildlife sites (LWS) within the Curdworth to Middleton area that could potentially be affected by changes in air quality as a result of the Proposed Scheme. These are Dunton Coppice LWS, south of the A4097 Kingsbury Road and North Wood LWS,

south of Middleton House Farm. The SSSI and LWS sites have been identified based on potential sensitivity to dust deposition.

*Operational phase*

- 3.2.5 The Middleton Pools SSSI could potentially be affected by the operation of the Proposed Scheme, due to permanent realignment of the A4091 Tamworth Road.

## 4 Dust impact evaluation and risk rating

- 4.1.1 The following table provides details of the assessment of construction impacts following the Institute of Air Quality Management (IAQM) guidance<sup>7</sup>. Where considered useful to identify receptors and their relationship to the construction activity a specific figure is provided.
- 4.1.2 The construction activities considered were demolition; construction of the Kingsbury Road railhead; the construction of new structures; earthworks, including the movement of materials on the haul road along the line of the Proposed Scheme; and dust and mud deposited onto public highways from vehicles travelling to and from construction areas (referred to as trackout in the IAQM guidance).

Table 2: Evaluation and risk rating of construction activities

| Activity  | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications  |
|---|------------------------------|---------------------|--------------------|---------------------------------|---|---|
| <b>Properties around Newlands Farm, Faraday Avenue, Curdworth (Map-AQ-02-020-01, Figure 20.1)</b> |                              |                     |                    |                                 |   |   |
| Demolition  | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m   |
| Earthworks  | Less than 20m                | Large               | High               | High                            | Slight adverse                                      | Properties 3m from earthworks and over 50m from haul road<br>Total area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months |
| Construction  | Less than 20m                | Large               | High               | High                            | Slight adverse                                      | Properties 3m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months   |

<sup>7</sup> IAQM (2012), *Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance*.

| Activity   | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications  |
|--|------------------------------|---------------------|--------------------|---------------------------------|---|---|
| Trackout   | 20m-50m                      | Medium              | Medium             | Low                             | Negligible  | Properties more than 20m from trackout route<br>25-100 HDV trips per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of trackout expected to be more than 12 months   |
| <b>Dunton Hall, A4097 Kingsbury Road, Curdworth (Map-AQ-02-020-01 Figure 20.2)</b> |                              |                     |                    |                                 |   |   |
| Demolition   | 20m-100m                     | Large               | High               | Low                             | Negligible  | Property more than 20m from demolition<br>Total volume of demolition greater than 50,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of demolition expected to be more than 12 months   |
| Earthworks   | 50m-100m                     | Large               | Medium             | Low                             | Negligible  | Property more than 20m from earthworks and over 100m from haul road<br>Total area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months |
| Construction   | 100m-200m                    | Large               | Medium             | Low                             | Negligible  | Property more than 20m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months  |
| Trackout   | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No trackout route within 100m.  |

## Appendix AQ-001-020 | Dust impact evaluation and risk rating

| Activity  | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications   |
|---|------------------------------|---------------------|--------------------|---------------------------------|---|--|
| <b>Elford, A4097 Kingsbury Road, Curdworth (Map-AQ-02-020-01 Figure 20.3)</b>                                 |                              |                     |                    |                                 |   |  |
| Demolition  | 20m-100m                     | Large               | High               | Low                             | Negligible  | Property more than 20m from demolition<br>Total volume of demolition greater than 50,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of demolition expected to be more than 12 months  |
| Earthworks  | 50m-100m                     | Large               | Medium             | Low                             | Negligible  | Property more than 20m from earthworks and over 100m from haul road, Over 50m from Kingsbury Road railhead<br>Total area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months |
| Construction  | 100m-200m                    | Large               | Medium             | Low                             | Negligible  | Property more than 100m from construction. Over 50m from Kingsbury Road railhead<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12months  |
| Trackout  | 20m-50m                      | Large               | Medium             | Low                             | Negligible  | Property more than 20m from trackout route<br>Over 100 HDV trips per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of trackout expected to be more than 12 months  |
| <b>Properties around Marston Lane, Curdworth (Map-AQ-02-020-01 Figure 20.4 and Map-AQ-020-02 Figure 20.5)</b> |                              |                     |                    |                                 |   |  |
| Demolition  | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m  |

| Activity  | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications  |
|---|------------------------------|---------------------|--------------------|---------------------------------|---|---|
| Earthworks  | Less than 20m                | Large               | High               | High                            | Slight adverse                                      | Properties more than 50m from earthworks, but within 20m of haul road<br>Total area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months |
| Construction  | 20m-50m                      | Large               | High               | Low                             | Negligible  | Properties over 20m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months   |
| Trackout  | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No trackout route within 100m   |
| <b>Property along Cuttle Mill Lane, Wishaw (Map-AQ-02-020-02 Figure 20.6)</b> |                              |                     |                    |                                 |   |   |
| Demolition  | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m   |
| Earthworks  | 50m-100m                     | Large               | Medium             | Low                             | Negligible  | Property more than 20m from earthworks and haul road<br>Total site area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months             |
| Construction  | 100m-200m                    | Large               | Medium             | Low                             | Negligible  | Property more than 20m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months  |

## Appendix AQ-001-020 | Dust impact evaluation and risk rating

| Activity  | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications   |
|---|------------------------------|---------------------|--------------------|---------------------------------|---|--|
| Trackout  | Less than 20m                | Medium              | Medium             | High                            | Negligible  | Property 15m from trackout route<br><br>25-100 HDV trips per day<br><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br><br>Duration of trackout expected to be more than 12 months  |
| <b>Property at Middleton Farm, off A4091 Tamworth Road, Middleton(Map-AQ-02-020-02 Figure 20.7)</b> |                              |                     |                    |                                 |   |  |
| Demolition  | 20-100m                      | Large               | High               | Low                             | Negligible  | Property more than 20m from demolition<br><br>Total volume of demolition greater than 50,000m <sup>3</sup><br><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br><br>Duration of demolition expected more than 12 months  |
| Earthworks  | 50m-100m                     | Large               | Medium             | Low                             | Negligible  | Property more than 20m from earthworks<br><br>Total area of earthworks greater than 10,000m <sup>2</sup><br><br>More than 10 heavy earth moving vehicles on haul road per day<br><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br><br>Duration of earthworks expected to be more than 12 months |
| Construction  | 50m-100m                     | Large               | Medium             | Low                             | Negligible  | Property more than 20m from construction and over 100m from haul road<br><br>Total volume of construction greater than 100,000m <sup>3</sup><br><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br><br>Duration of construction expected to be more than 12 months                                |

| Activity  | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications   |
|---|------------------------------|---------------------|--------------------|---------------------------------|---|--|
| Trackout  | 20m-50m                      | Large               | Medium             | Low                             | Negligible  | Property over 20m from trackout route<br>Over 100 HDV trips per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of trackout expected to be more than 12 months   |
| <b>Primrose Cottage, Bodymoor Heath Lane, Middleton(Map-AQ-02-020-02 Figure 20.8)</b>                     |                              |                     |                    |                                 |   |  |
| Demolition  | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m  |
| Earthworks  | 20m-50m                      | Large               | High               | Low                             | Negligible  | Property more than 20m from earthworks and over 100m from haul road<br>Total site area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months |
| Construction  | 20m-50m                      | Large               | High               | Low                             | Negligible  | Property over 20m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months  |
| Trackout  | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No trackout route within 100m  |
| <b>Pool House Farm, Brink Kiln Lane, off A4091 Tamworth Road, Middleton(Map-AQ-02-020-03 Figure 20.9)</b> |                              |                     |                    |                                 |   |  |
| Demolition  | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m  |

## Appendix AQ-001-020 | Dust impact evaluation and risk rating

| Activity   | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications   |
|--|------------------------------|---------------------|--------------------|---------------------------------|---|--|
| Earthworks   | 100m-200m                    | Large               | Medium             | Low                             | Negligible  | Property more than 20m from earthworks and over 100m from haul road<br>Total site area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months |
| Construction   | 100m-200m                    | Large               | Medium             | Low                             | Negligible  | Property more than 20m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months   |
| Trackout   | 20m-50m                      | Large               | Medium             | Low                             | Negligible  | Property over 20m from trackout route<br>Over 100 HDV trips per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of trackout expected to be more than 12 months   |
| <b>Properties along Church Lane, Middleton (Map-AQ-02-020-03 Figure 20.10)</b> |                              |                     |                    |                                 |   |  |
| Demolition   | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m  |
| Earthworks   | 20m-50m                      | Large               | High               | Low                             | Negligible  | Properties more than 20m from earthworks and over 100m from haul road<br>Total site area of earthworks greater than 10,000m <sup>2</sup><br>More than 10 heavy earth moving vehicles on haul road per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected more than 12 months     |

| Activity   | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications  |
|--|------------------------------|---------------------|--------------------|---------------------------------|---|---|
| Construction   | 20m-50m                      | Large               | High               | Low                             | Negligible  | Properties more than 20m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months                        |
| Trackout   | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No trackout route within 100m   |
| <b>Parkgate Farm, A4091 Tamworth Road, Middleton (Map-AQ-02-020-03 Figure 20.11)</b> |                              |                     |                    |                                 |   |   |
| Demolition   | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m   |
| Earthworks   | 100m-200m                    | Large               | Medium             | Low                             | Negligible  | Property more than 20m from earthworks and over 350m from haul road<br>Total site area of earthworks greater than 10,000m <sup>2</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of earthworks expected to be more than 12 months |
| Construction   | 100m-200m                    | Large               | Medium             | Low                             | Negligible  | Property more than 20m from construction<br>Total volume of construction greater than 100,000m <sup>3</sup><br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of construction expected to be more than 12 months                          |
| Trackout   | Less than 20m                | Medium              | Medium             | High                            | Negligible  | Property 15m from trackout route<br>25-100 HDV trips per day<br>Baseline PM <sub>10</sub> concentrations less than 75% of air quality standard<br>Duration of trackout expected to be more than 12 months   |
| <b>Middleton Pool SSSI</b>   |                              |                     |                    |                                 |   |   |
| Demolition   | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m   |

## Appendix AQ-001-020 | Dust impact evaluation and risk rating

| Activity                  | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications  |
|---------------------------|------------------------------|---------------------|--------------------|---------------------------------|---|---|
| Earthworks                | 20m-40m                      | Large               | Medium             | High                            | Negligible  | <p>Nationally important ecological site</p> <p>Ecological receptor more than 20m from earthworks and over 200m from haul road</p> <p>Total site area of earthworks greater than 10,000m<sup>2</sup></p> <p>Baseline PM<sub>10</sub> concentrations less than 75% of air quality standard</p> <p>Duration of earthworks expected more than 12 months</p> |
| Construction              | 20m-40m                      | Large               | Medium             | High                            | Negligible  | <p>Nationally important ecological site</p> <p>Ecological receptor 10m from construction</p> <p>Total volume of construction greater than 100,000m<sup>3</sup></p> <p>Baseline PM<sub>10</sub> concentrations less than 75% of air quality standard</p> <p>Duration of construction expected to be more than 12 months</p>                              |
| Trackout                  | Less than 20m                | Large               | Medium             | High                            | Negligible  | <p>Nationally important ecological site</p> <p>Ecological receptor 10m from trackout route</p> <p>Over 100 HDV trips per day</p> <p>Baseline PM<sub>10</sub> concentrations less than 75% of air quality standard</p> <p>Duration of trackout expected to be more than 12 months</p>  |
| <b>Dunton Coppice LWS</b> |                              |                     |                    |                                 |   |   |
| Demolition                | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m   |

| Activity              | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications   |
|-----------------------|------------------------------|---------------------|--------------------|---------------------------------|---|--|
| Earthworks            | 40m-100m                     | Large               | Low                | Low                             | Negligible  | <p>Locally important ecological site</p> <p>Ecological receptor more than 20m from earthworks and haul road</p> <p>Total site area of earthworks greater than 10,000m<sup>2</sup></p> <p>More than 10 heavy earth moving vehicles on haul road per day</p> <p>Baseline PM<sub>10</sub> concentrations less than 75% of air quality standard</p> <p>Duration of earthworks expected more than 12 months</p> |
| Construction          | 40m-100m                     | Large               | Low                | Low                             | Negligible  | <p>Locally important ecological site</p> <p>Ecological receptor more than 20m from construction</p> <p>Total volume of construction greater than 100,000m<sup>3</sup></p> <p>Baseline PM<sub>10</sub> concentrations less than 75% of air quality standard</p> <p>Duration of construction expected more than 12 months</p>  |
| Trackout              | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No trackout route within 100m  |
| <b>North Wood LWS</b> |                              |                     |                    |                                 |   |  |
| Demolition            | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No demolition within 350m  |
| Earthworks            | Less than 20m                | Large               | Medium             | Medium                          | Negligible  | <p>Locally important ecological site</p> <p>Ecological receptor less than 20m from earthworks and haul road</p> <p>Total site area of earthworks greater than 10,000m<sup>2</sup></p> <p>More than 10 heavy earth moving vehicles on haul road per day</p> <p>Baseline PM<sub>10</sub> concentrations less than 75% of air quality standard</p> <p>Duration of earthworks expected more than 12 months</p> |

Appendix AQ-001-020 | Dust impact evaluation and risk rating

| Activity     | Distance to nearest receptor | Dust emission class | Dust risk category | Sensitivity of surrounding area | Magnitude of impact (with CoCP mitigation measures) | Principal justifications   |
|--------------|------------------------------|---------------------|--------------------|---------------------------------|---|--|
| Construction | Less than 20m                | Large               | Medium             | Medium                          | Negligible  | Locally important ecological site<br><br>Ecological receptor less than 20m from construction<br><br>Total volume of construction greater than 100,000m <sup>3</sup><br><br>Baseline PM10 concentrations less than 75% of air quality standard<br><br>Duration of construction expected more than 12 months |
| Trackout     | n/a                          | n/a                 | n/a                | n/a                             | n/a   | No trackout route within 100m  |

Table 3: Summary of construction dust impacts and effects

| Location   | Magnitude of impact (with CoCP mitigation measures) | Effect of dust-generating activities | Additional mitigation |
|--|---|--------------------------------------|-----------------------|
| Properties around, Newlands Farm, Faraday Avenue, Curdworth          | Slight adverse                                      | Not significant                      | None required         |
| Dunton Hall, A4097 Kingsbury Road, Curdworth                         | Negligible  | Not significant                      | None required         |
| Elford, A4097 Kingsbury Road, Curdworth                              | Negligible  | Not significant                      | None required         |
| Properties along Marston Lane, Curdworth                             | Slight adverse                                      | Not significant                      | None required         |
| Property on Cuttle Mill Lane, Wishaw                                 | Negligible  | Not significant                      | None required         |
| Property at Middleton Farm, A4091 Tamworth Road, Middleton           | Negligible  | Not significant                      | None required         |
| Primrose Cottage, Bodymoor Heath Lane, Middleton                     | Negligible  | Not significant                      | None required         |
| Pool House Farm, Brick Kiln Lane, off A4091 Tamworth Road, Middleton | Negligible  | Not significant                      | None required         |
| Properties along Church Lane, Middleton                              | Negligible  | Not significant                      | None required         |
| Parkgate Farm, A4091 Tamworth Road, Middleton                        | Negligible  | Not significant                      | None required         |
| Middleton Pool SSSI  | Negligible  | Not significant                      | None required         |
| Dunton Coppice LWS   | Negligible  | Not significant                      | None required         |
| North Wood LWS   | Negligible  | Not significant                      | None required         |

## 5 Air quality assessment road traffic

### 5.1 Overall assessment approach

- 5.1.1 The air quality assessment for road related emissions has used three different approaches based on the scale of changes in traffic and road alignment. Where the Design Manual for Roads and Bridges<sup>8</sup> (DMRB) thresholds detailed in the SMR (Volume 5: Appendix CT-001-000/1) will not be exceeded, any additional assessment is not required as the air quality impacts will be minimal. If these thresholds are breached, then an assessment has been carried out.
- 5.1.2 If it is considered unlikely that air quality standards will be exceeded and the road configuration is a simple one, then the DMRB screening method has been used to predict changes in air quality. Where there will be a risk of standards being exceeded, where the road layout is considered to be complex or where the use of the DMRB screening method has indicated that there will be a potential exceedance of air quality standards, then the atmospheric dispersion model ADMS-Roads has been used for the assessment. Professional judgment has been used to select the appropriate tool for each area.
- 5.1.3 In this study area the DMRB screening method was considered to be a suitable tool for the assessment, as baseline air quality will be below air quality standards, there is a simple road layout and there are limited numbers of receptors close to roads affected during construction and operation of the Proposed Scheme.
- 5.1.4 An assessment of nitrogen deposition and NO<sub>x</sub> concentrations was also undertaken at the Middleton Pool SSSI for the operational phase of the Proposed Scheme. Information on the critical load and average nitrogen deposition for the main habitats within the SSSI were taken from the Air Pollution Information System website<sup>9</sup>. Future deposition rates for the SSSI were calculated assuming a 2% reduction per year as in accordance with the DMRB methodology<sup>8</sup>. The predicted changes were then compared to the 1% value of the relevant air standard in accordance with the DMRB methodology<sup>8</sup>.

### 5.2 Construction traffic model

- 5.2.1 Construction traffic data used in this assessment are detailed in Volume 5: Appendix TR-001-000. The construction scenario used traffic data from the year of maximum intensity of construction (2021) but assumed this would occur in the first year of construction (2017).
- 5.2.2 Screening using the DMRB traffic and road alignment change criteria was undertaken to determine locations requiring assessment. Three locations within the Curdworth to Middleton area met the criteria for assessment of a change in traffic emissions during the construction phase. The locations are Faraday Avenue, Curdworth; A446 Lichfield Road between B4418 Marsh Lane and A4091 Tamworth Road; and A4091 Tamworth Road between A446 Lichfield Road and Cuttle Mill Lane. There will be a temporary

<sup>8</sup> Highways Agency (2007), *The Design Manual for Roads and Bridges* (Volume 11, Section 3, Part 1 Air Quality HA207/07).

<sup>9</sup> Air Pollution Information System; Site relevant critical loads and source attribution; <http://www.apis.ac.uk/src/>; Accessed August 2013.

realignment of Faraday Avenue which required assessment of changes in concentrations at receptors around this road. On the A446 Lichfield Road and A4091 Tamworth Road the increase in construction traffic was sufficient to require assessment of changes in concentrations at receptors around these roads. No locations were identified as requiring assessment due to construction traffic movements on the haul road.

## Receptors assessed

- 5.2.3 For locations where DMRB traffic and road alignment change criteria for local air quality were met, a number of receptors representative of worst-case exposure locations were selected for quantitative assessment. These included locations representative of highest concentrations along the roads, including closest to junctions or to the road itself. Receptors assessed are listed in Table 4 and shown in Volume 5: Map AQ-01-020.

Table 4: Modelled receptors (construction phase)

| Receptor | Description/Location                       | Ordnance Survey coordinates |
|----------|--|-----------------------------|
| 20-1     | Orchard Bungalow, Newlands Lane, Curdworth | 419176, 292313              |

## Background concentrations

- 5.2.4 The background concentrations used in the assessment are shown in Table 5 taken from the Defra Maps.

Table 5: Background 2017 concentrations at assessed receptors

| Receptor (or zone of receptors) | Concentrations ( $\mu\text{g}/\text{m}^3$ ) |                 |                  |
|---------------------------------|---|-----------------|------------------|
|                                 | NO <sub>x</sub>                             | NO <sub>2</sub> | PM <sub>10</sub> |
| 20-1 (Orchard Bungalow)         | 30.8  | 20.5            | 16.1             |

## DMRB model results

- 5.2.5 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the Environmental Protection UK (EPUK) methodology<sup>10</sup>.

Table 6: Summary of DMRB annual mean NO<sub>2</sub> results (construction phase)

| Receptor                | Concentrations ( $\mu\text{g}/\text{m}^3$ ) |                              |                           | Change in concentrations ( $\mu\text{g}/\text{m}^3$ ) | Magnitude of change | Impact descriptor |
|-------------------------|---|------------------------------|---------------------------|---|---------------------|-------------------|
|                         | 2012 baseline                               | 2017 without Proposed Scheme | 2017 with Proposed Scheme |   |                     |                   |
| 20-1 (Orchard Bungalow) | 29.8  | 25.1                         | 25.2                      | 0.1   | Imperceptible       | Negligible        |

<sup>10</sup> Environmental Protection UK (EPUK) (2010), *Development Control: Planning for Air Quality*.

Table 7: Summary of DMRB annual mean PM<sub>10</sub> results (construction phase)

| Receptor                | Concentrations (µg/m <sup>3</sup> ) |                              |                           | Change in concentrations (µg/m <sup>3</sup> ) | Magnitude of change | Impact descriptor |
|-------------------------|-------------------------------------|------------------------------|---------------------------|---|---------------------|-------------------|
|                         | 2012 baseline                       | 2017 without Proposed Scheme | 2017 with Proposed Scheme |   |                     |                   |
| 20-1 (Orchard Bungalow) | 17.8                                | 16.7                         | 16.7                      | 0.0   | Imperceptible       | Negligible        |

5.2.6 Annual mean NO<sub>2</sub> and PM<sub>10</sub> concentrations will be below the air quality standards both with and without the Proposed Scheme for the construction phase. The hourly mean NO<sub>2</sub> air quality standard will also be met as annual mean NO<sub>2</sub> concentrations will be well below 60µg/m<sup>3</sup>. In addition the daily mean PM<sub>10</sub> air quality standard will also be met. It is not possible to model PM<sub>2.5</sub> using the DMRB screening model, but given the PM<sub>10</sub> concentrations, the annual mean PM<sub>2.5</sub> concentrations will be below the air quality standard.

5.2.7 Changes in modelled concentrations with and without the Proposed Scheme have been calculated to determine the impact to local air quality. The change in NO<sub>2</sub> and PM<sub>10</sub> concentrations is imperceptible. The magnitude of impact will be negligible at the receptor for NO<sub>2</sub> and PM<sub>10</sub>.

5.2.8 In certain instances additional qualitative assessment has been undertaken. This was the case for the A446 Lichfield Road between B4418 Marsh Lane and A4091 Tamworth Road and A4091 between A446 Lichfield Road and Cuttle Mill Lane, which were identified as meeting the criteria for assessment due to an increase in construction traffic. The qualitative assessment concluded that the magnitude of impact for NO<sub>2</sub> is expected to be slight adverse at receptors along the A446 Lichfield Road and negligible at receptors along the A4091. For PM<sub>10</sub> the magnitude of impact is expected to be negligible at receptors along these roads. The expected magnitude of impact has been determined on the basis of the magnitude of construction traffic increases, the baseline air quality is below air quality standards, the distance to the receptors from the roads and the existing traffic flows on the construction traffic routes.

### Assessment of significance

5.2.9 Considering the significance of the air quality impacts according to the criteria set in the EPUK methodology<sup>10</sup>, the following points are noted:

- the magnitude of impact is negligible to slight adverse for NO<sub>2</sub> and negligible for PM<sub>10</sub> at receptors; and
- pollutant concentrations are well below the air quality standards for both NO<sub>2</sub> and PM<sub>10</sub> with and without the Proposed Scheme.

5.2.10 Based on the above, the effect on air quality due to construction traffic emission will not be significant

## 5.3 Operational traffic model

5.3.1 Operational traffic data used in this assessment are detailed in Volume 5: Appendix TR-001-000. The operational scenario used traffic data from the first year of opening of the Proposed Scheme (2026).

- 5.3.2 Screening using the DMRB traffic and road alignment change criteria was undertaken to determine locations requiring assessment. Four locations within the Curdworth to Middleton area met the criteria for an assessment of emissions from traffic during the operational stage, following completion of the Proposed Scheme. These locations are the A4097 Kingsbury Road, Curdworth; Bodymoor Heath Lane, Middleton; Church Lane, Middleton; and the A4091 Tamworth Road. At all these locations there will be permanent road realignments which required assessment of changes in concentrations at receptors around these roads.

### Receptors assessed

- 5.3.3 For locations where DMRB traffic and road alignment change criteria for local air quality were met, a number of receptors representative of worst-case exposure locations were selected for quantitative assessment. These included locations representative of highest concentrations along the roads, including closest to junctions or to the road itself. Receptors assessed are listed in Table 8 and shown in Volume 5: Map AQ-01-020.

Table 8: Modelled receptors (operational phase)

| Receptor | Description/Location  | Ordnance Survey coordinates |
|----------|---|-----------------------------|
| 20-2     | Dunton Hall, Kingsbury Road, Curdworth  | 419022, 293455              |
| 20-3     | Elford, Kingsbury Road, Curdworth,  | 419405, 294023              |
| 20-4     | Primrose Cottage, Bodymoor Heath Lane, Middleton  | 419216, 296616              |
| 20-5     | Pool House Farm, Brick Kiln Lane, Middleton (adjacent to Bodymoor Heath Road realignment) | 418754, 296863              |
| 20-6     | The Spinney, Church Lane, Middleton,  | 418161, 298220              |
| 20-7     | Middleton Pool SSSI site boundary(adjacent to A4091Tamworth Road realignment)             | 418747,298019               |

### Background concentrations

- 5.3.4 The background concentrations used in the assessment are shown in Table 9 taken from the Defra maps.

Table 9: Background 2026 concentrations at assessed receptors

| Receptor (or zone of receptors) | Concentrations ( $\mu\text{g}/\text{m}^3$ ) |                 |                  |
|---------------------------------|---|-----------------|------------------|
|                                 | NOx   | NO <sub>2</sub> | PM <sub>10</sub> |
| 20-2 (Dunton Hall)              | 22.5  | 15.6            | 15.6             |
| 20-3 (Elford)                   | 21.7  | 15.2            | 16.8             |
| 20-4 (Primrose Cottage)         | 15.8  | 11.5            | 14.3             |
| 20-5 (Pool House Farm)          | 15.9  | 11.5            | 14.1             |
| 20-6 (The Spinney)              | 14.2  | 10.4            | 14.1             |
| 20-7 (Middleton Pools SSSI)     | 14.2  | 10.4            | 14.1             |

## DMRB model results

5.3.5 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the EPUK methodology<sup>10</sup>.

Table 10: Summary of DMRB annual mean NO<sub>2</sub> results (operational phase)

| Receptor                | Concentrations (µg/m <sup>3</sup> ) |                           | Change in concentrations (µg/m <sup>3</sup> ) | Magnitude of change | Impact descriptor |
|-------------------------|-------------------------------------|---------------------------|---|---------------------|-------------------|
|                         | 2026 without Proposed Scheme        | 2026 with Proposed Scheme |   |                     |                   |
| 20-2 (Dunton Hall)      | 16.0                                | 16.0                      | 0.0   | Imperceptible       | Negligible        |
| 20-3 (Elford)           | 19.7                                | 19.7                      | 0.0   | Imperceptible       | Negligible        |
| 20-4 (Primrose Cottage) | 12.0                                | 12.0                      | 0.0   | Imperceptible       | Negligible        |
| 20-5 (Pool House Farm)  | 13.6                                | 13.6                      | 0.0   | Imperceptible       | Negligible        |
| 20-6 (The Spinney)      | 10.7                                | 10.8                      | 0.1   | Imperceptible       | Negligible        |

Table 11: Summary of DMRB annual mean PM<sub>10</sub> results (operational phase)

| Receptor                | Concentrations (µg/m <sup>3</sup> ) |                           | Change in concentrations (µg/m <sup>3</sup> ) | Magnitude of change | Impact descriptor |
|-------------------------|-------------------------------------|---------------------------|---|---------------------|-------------------|
|                         | 2026 without Proposed Scheme        | 2026 with Proposed Scheme |   |                     |                   |
| 20-2 (Dunton Hall)      | 15.6                                | 15.6                      | 0.0   | Imperceptible       | Negligible        |
| 20-3 (Elford)           | 17.4                                | 17.4                      | 0.0   | Imperceptible       | Negligible        |
| 20-4 (Primrose Cottage) | 14.4                                | 14.4                      | 0.0   | Imperceptible       | Negligible        |
| 20-5 (Pool House Farm)  | 14.5                                | 14.5                      | 0.0   | Imperceptible       | Negligible        |
| 20-6 (The Spinney)      | 14.2                                | 14.2                      | 0.0   | Imperceptible       | Negligible        |

Table 12: Results of ecological assessment (operational phase)

| Receptor             | Nitrogen deposition rate (kg N/ha/year) |                           |                              |                           |        | NOx concentrations (µg/m³) |                            |                              |                           |        |
|----------------------|---|---------------------------|------------------------------|---------------------------|--------|----------------------------|----------------------------|------------------------------|---------------------------|--------|
|                      | Critical load                           | 1% of lower critical load | 2026 without Proposed Scheme | 2026 with Proposed Scheme | Change | Air quality standard       | 1% of air quality standard | 2026 without Proposed Scheme | 2026 with Proposed Scheme | Change |
| Middleton Pools SSSI | 10-20                                   | 0.10                      | 26.6                         | 26.3                      | -0.3   | 30.0                       | 0.3                        | 25.4                         | 18.0                      | -7.4   |

- 5.3.6 Annual mean NO<sub>2</sub> and PM<sub>10</sub> concentrations will be below the air quality standards both with and without the Proposed Scheme for the operation phase. The hourly mean NO<sub>2</sub> air quality standard will also be met as annual mean NO<sub>2</sub> concentrations will be well below 60µg/m<sup>3</sup>. In addition the daily mean PM<sub>10</sub> air quality standard will also be met. It is not possible to model PM<sub>2.5</sub> using the DMRB screening model, but given the PM<sub>10</sub> concentrations, the annual mean PM<sub>2.5</sub> concentrations will be below the air quality standard.
- 5.3.7 Changes in modelled concentrations with and without the Proposed Scheme have been calculated to determine the impact to local air quality. The change in NO<sub>2</sub> and PM<sub>10</sub> concentrations is imperceptible at receptors.
- 5.3.8 From the ecological receptor an assessment of changes in nitrogen deposition and NO<sub>x</sub> concentrations was undertaken. The main habitat in the part if the site affected by the Proposed Scheme is broadleaf, mixed and yew woodland (sub category broadleaved deciduous woodland), with a critical load of 10-20kg N/ha/year and an average deposition of 38.5kg N/ha/year for the 2009-2011 period. It can be observed that existing nitrogen deposition rates currently exceed the critical load without the Proposed Scheme in the operational phase.
- 5.3.9 The predicted change in nitrogen deposition with and without the Proposed Scheme in 2026 will be more than 1% of the critical load however with the Proposed Scheme there will be a decrease in the nitrogen deposition rate. Concentrations of NO<sub>x</sub> will be below the air quality standard with and without the Proposed Scheme and there will be a decrease in concentrations with the Proposed Scheme.

### Assessment of significance

- 5.3.10 Considering the significance of the air quality impacts according to the criteria set in the EPUK methodology<sup>10</sup>, the following points are noted:
- the magnitude of impact is negligible for NO<sub>2</sub> and PM<sub>10</sub> at all receptors; and
  - pollutant concentrations are well below the air quality standards for both NO<sub>2</sub> and PM<sub>10</sub> with and without the Proposed Scheme.
- 5.3.11 Based on the above, the effect on air quality due to operational traffic emissions will not be significant at residential properties.
- 5.3.12 For the SSSI site there will be a reduction in nitrogen deposition and NO<sub>x</sub> concentrations, however this is not considered significant as the Proposed Scheme will not reduce nitrogen deposition below the critical load.

## 6 Air quality assessment construction phase rail emissions

- 6.1.1 The Kingsbury Road railhead will be constructed and will be in use for the duration of the construction period. Screening was undertaken to determine the effect on air quality due to the use of diesel trains at the railhead. Screening is based on the baseline air quality and distance of receptors from diesel trains. It is not required for the number of train movements to be considered for the screening. Baseline concentrations of annual mean NO<sub>2</sub> are 27µg/m<sup>3</sup>, based on local monitoring data, which is above 25µg/m<sup>3</sup>, but there are no human or ecological receptors within 30m of diesel trains used within the railhead. On this basis, the magnitude of impact will be negligible.
- 6.1.2 The effects on air quality anticipated to arise due to the Kingsbury Road railhead while in use during construction of the Proposed Scheme will not be significant.

## 7 References

Air Pollution Information System; Site relevant critical loads and source attribution;  
<http://www.apis.ac.uk/src1>; accessed August 2013

Department for Environment, Food and Rural Affairs; Background Maps;  
<http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>; accessed: July 2013.

Environment Agency; What's in your backyard website;  
<http://www.environmentagency.gov.uk/default.aspx>; accessed July 2013.

*Environment Act 1995* (c. 25). London, Her Majesty's Stationery Office.

Environmental Protection UK (EPUK) (2010), *Development Control: Planning for Air Quality*.

Highways Agency (2007), *The Design Manual for Roads and Bridges* (Volume 11, Section 3, Part 1 Air Quality HA207/07).

Institute of Air Quality Management (2012), *Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance*.

North Warwickshire Borough Council (2006), *North Warwickshire Local Plan*; adopted 2006.

North Warwickshire Borough Council (2013), *2013 Air Quality Progress Report for North Warwickshire Borough Council*.

North Warwickshire Borough Council (2013), *North Warwickshire Core Strategy – Submission Version*, February 2013.

Warwickshire County Council (2010/2011), *Warwickshire Local Transport Plan 2011-2026*.